### Smith Economics Group, Ltd.

A Division of Corporate Financial Group Economics / Finance / Litigation Support

Stan V. Smith, Ph.D. President

August 1, 2019

Mr. John M. Eubanks Motley Rice 28 Bridgeside Blvd. Mt. Pleasant, SC 29464

Re: Snyder

Dear Mr. Eubanks:

You have asked me to calculate the value of certain losses subsequent to the death of Christine Snyder. These losses are: (1) the loss of wages and employee benefits; (2) the loss of housekeeping and household management services; and (3) the loss of the value of life ("LVL"), also known as loss of enjoyment of life.

#### QUALIFICATIONS AND EXPERIENCE

I am President of Smith Economics Group, Ltd., headquartered in Chicago, IL, which provides economic and financial consulting nationwide. I have worked as an economic and financial consultant since 1974, after completing a Research Internship at the Federal Reserve, Board of Governors, in Washington, D.C. My curriculum vitae lists all my publications in the last 10 years and beyond.

I received my Bachelor's Degree from Cornell University. I received a Master's Degree and my Ph.D. in Economics from the University of Chicago; Gary S. Becker, Nobel Laureate 1992, was my Ph.D. thesis advisor. The University of Chicago is one of the world's preeminent institutions for the study of economics, and the home of renowned research in the law and economics movement.

As President of Smith Economics, I have performed economic analyses in a great variety of engagements, including damages analysis in personal injury and wrongful death cases, business valuation, financial analysis, antitrust, contract losses, a wide range of class action matters, employment discrimination, defamation, and intellectual property valuations including evaluations of reasonable royalty.

I have more than 40 years of experience in the field of economics. I am a member of various economic associations and served for three years as Vice President of the National Association of Forensic Economics (NAFE) which is the principal association in the field. I was also on the Board of Editors of

the peer-reviewed journal, the Journal of Forensic Economics, for over a decade; I have also published scholarly articles in this journal. The JFE is the leading academic journal in the field of Forensic Economics.

I am the creator and founder of Ibbotson Associates' Stock, Bonds, Bills, and Inflation (SBBI) Yearbook, Quarterly, Monthly, and SBBI/PC Services. SBBI is currently published by Duff & Phelps and is also available on various Morningstar, Inc. software platforms. SBBI is widely relied upon and regarded as the most accepted and scholarly reference by the academic, actuarial and investment community, and in courts of law. The SBBI series, which acknowledges my "invaluable role" as having "originated the idea" while Managing Director at Ibbotson Associates, is generally regarded by academics in the field of finance as the most widely accepted source of statistics on the rates of return on investment securities.

I wrote the first textbook on Forensic Economic Damages that has been used in university courses in various states; as an adjunct professor, I created and taught the first course in Forensic Economics nationwide, at DePaul University in Chicago. I have performed economic analysis in many thousands of cases in almost every state since the early 1980s.

#### BACKGROUND

Christine Snyder was a 32.1-year-old, Caucasian female, who was born on an analysis and died on September 11, 2001. Ms. Snyder's remaining life expectancy is estimated at 50.1 years. This data is from the National Center for Health Statistics, United States Life Tables, 2015, Vol. 67, No. 7, National Vital Statistics Reports, 2018. I assume an estimated trial or resolution date of January 1, 2020.

In order to perform this evaluation, I have reviewed the following materials: (1) tax records for Christina Snyder from 1996 through 2001; (2) employment records from The Outdoor Circle; (3) the declaration of Mary Steiner; (4) pictures of Christine Snyder and her family; (5) an interview with Ian Pescaia on June 22, 2004; and (6) the case information form.

My methodology for estimating the losses, which is explained below, is generally based on past wage growth, interest rates, and consumer prices, as well as studies regarding the value of life. The effective net discount rate using statistically average wage growth rates and statistically average discount rates is 0.25 percent.

My estimate of the real wage growth rate is 1.00 percent per year. This growth rate is based on Business Sector, Hourly

Compensation growth data from the Major Sector Productivity and Costs Index found at the U.S. Bureau of Labor Statistics website at <a href="https://www.bls.qov/data/home.htm">www.bls.qov/data/home.htm</a>, Series ID: PRS84006103, for the real increase in wages primarily for the last 20 years.

Estimates of real growth and discount rates are net of inflation based on the Consumer Price Index (CPI-U), published in monthly issues of the U.S. Bureau of Labor Statistics, <u>CPI Detailed Report</u> (Washington, D.C.: U.S. Government Printing Office) and available at the U.S. Bureau of Labor Statistics website at <a href="https://www.bls.gov/data/home.htm">www.bls.gov/data/home.htm</a>, Series ID: CUUR0000SAO. The rate of inflation for the past 20 years has been 2.16 percent.

#### I. LOSS OF WAGES AND EMPLOYEE BENEFITS - Annual Employment

Tables 1 through 9 show the loss of wages and benefits for Christine Snyder. Ms. Snyder was the Project Manager for Landscape and Planting for The Outdoor Circle at the time of her death. Based on a letter from Mary Steiner, CEO of The Outdoor Circle, dated May 8, 2002, Ms. Snyder started working at The Outdoor Circle in May, 1995, and her job as advocate planner and project manager significantly expanded the capabilities of the organization. Her duties as a project manager included managing and overseeing large tree-planting projects, executing conferences and educational seminars for the organization, reviewing environmental impact statements, writing and putting together the quarterly newsletter and writing grant proposals to acquire funding for special projects. Ms. Steiner states that she believes Ms. Snyder was a team player and well respected by board members, staff, colleagues and volunteers. She states that she believes that Ms. Snyder's career would have continued to flourish and her leadership skills were directing her to greatness.

At the time of her death, Ms. Snyder's salary was \$40,000 in year 2001 dollars. Ms. Steiner states that the Board of Directors typically give salary increases around 5 percent per year, however, Ms. Snyder's average increases were higher than the general average increase. Ms. Steiner states that there is no reason to believe that Ms. Snyder's pay raises would not be consistent with her past pay raises. Based on information provided from Ms. Steiner, Ms. Snyder's increases ranged from 7

percent to 15 percent, and her last increase was 11 percent. Ms. Snyder's earnings from 1996 through 2001 grew by an average real rate of 8.27 percent per year. Ms. Snyder's 2001 earnings are projected to be \$38,667, based on her earnings through her date of death of \$27,000 and her actual salary of \$40,000.

The wage estimate is illustrated at Ms. Snyder's salary at the time of her death of \$40,000 in year 2001 dollars. Ms. Snyder's earnings are illustrated to increase at a real rate of 8.27 percent for 2 years, 6.00 percent for 2 years and 4.00 percent for 2 years. Ms. Snyder's earnings from 2008 through 2020 are illustrated at a real rate of 2.50 percent, which is conservative based on the average nominal salary increases at The Outdoor Circle of 5.00 percent. Ms. Snyder's earnings from 2021 and thereafter are grown at national average real wage growth of 1.0 percent. For past losses, the real growth rate is added to the actual inflation rates from 2002 through 2018, and to estimated inflation of 2.0 percent for 2019 and 2020.

Employee benefit estimates are based on actual benefit information as well as data from the U.S. Department of Labor, Bureau of Labor Statistics, Employer Cost of Employee Compensation - December 2018, 2019, found at <a href="www.bls.qov/ect">www.bls.qov/ect</a>. Based on Ms. Steiner's letter, dated May 8, 2002, the Board of Directors contributed 5 percent per year from 1996 through 2000 to the SEP/IRA. I have assumed that employee benefits grow at the same rate as wages and are discounted to present value at the same discount rate. Since these tables assume annual work, I do not include employee benefits relating to unemployment, injury, illness or disability; benefits are estimated at 23.4 percent of wages based on statistically average health benefits of 12.2 percent, retirement benefits of 5 percent, and Social Security benefits of 6.2 percent.

Personal consumption is an offset of the income. I use a personal consumption offset based on a study by Ruble, Patton, and Nelson, "Patton-Nelson Personal Consumption Tables 2011-12," <u>Journal of Legal Economics</u>, Vol. 21, No. 1, 2014, pp. 41-55, based on data from the U.S. Department of Labor, Bureau of Labor Statistics, "Consumer Expenditure Survey, 2011-12," Washington DC, 2012, which shows personal consumption for a 2-person household to be 19.3 percent.

I assume annual employment each year and show the accumulation through life expectancy. While these tables are calculated through the end of life expectancy, the losses from working through any age can be read off the table.

Based on the above assumptions, my opinion of the wage loss is \$4,846,720 ▶ Table 9; this figure assumes work to age 82.2, but the ability to work through any assumed age may be read from Table 9; for example, the loss to age 67 is \$3,274,045.

## II. LOSS OF HOUSEHOLD/FAMILY HOUSEKEEPING AND HOUSEHOLD MANAGEMENT SERVICES

Tables 10 through 12 show the pecuniary loss of tangible housekeeping chores and household management services. The number of hours of housekeeping and household management services for a married female is illustrated at 19.30 hours per week from 2001 through 2036 for females who work full-time and have no children in the household, and 29.49 Hours per week for retired, females. This data is based on the American Time Use Survey published by the Bureau of Labor Statistics, <a href="www.bls.gov/tus">www.bls.gov/tus</a>, usefully summarized in a publication by Expectancy Data, <a href="The Dollar Value of A Day: 2017 Dollar Valuation">The Dollar Value of A Day: 2017 Dollar Valuation</a>, Shawnee Mission, <a href="KS, 2018">KS, 2018</a>.

The hourly value of the housekeeping and household management services is based on the mean hourly earnings of painters, construction and maintenance; childcare workers; waiters and waitresses; cooks, private household; laundry and dry-cleaning workers; maids and housekeeping cleaners; landscaping and groundskeeping workers; bookkeeping, accounting and auditing clerks; and taxi drivers and chauffeurs, which is \$15.30 per hour in year 2018 dollars. This wage data is based on information from the U.S. Bureau of Labor Statistics, Occupational Employment Statistics, May 2018 National Occupational Employment and Wage Statistics found at <a href="https://www.bls.gov/oes">www.bls.gov/oes</a>. This figure is corroborated by the average hourly values published by Expectancy Data, <a href="https://www.bls.gov/oes">The Dollar Value of A Day: 2017 Dollar Valuation</a>, Shawnee Mission, <a href="https://www.bls.gov/oes">KS, 2018</a>, which is also based on the BLS Occupational Employment Statistics.

I assess such services at their estimated market value which includes a conservative estimate of 50 percent hourly non-wage component reasonably charged by agencies or free-lance individuals who supply such services on a part-time basis, and who are responsible for advertising, hiring and vetting, training, insuring and bonding the part-time service provider, and who are also responsible for pay-related costs such as social security contributions, etc. If a person were to hire a free-lance employee directly instead of going through an agency, then he or she would have to take on the responsibility for all the non-wage costs that the agency would otherwise incur and then charge for. The money the person would pay directly in wages would be only a portion of the total costs. The total costs would otherwise incur.

Adding the non-wage component to the hourly wage is consistent with labor market theory and competitive market behavior. Peer-reviewed economic research supports this theory and shows that the non-wage costs can average up to 300 percent for the wage. See, for example, Cushing, Matthew J. and David I. Rosenbaum,

"Valuing Household Services: A New Look at the Replacement Cost Approach, " Journal of Legal Economics, Vol 19, No. 1, 2012, pp. 37-60, wherein the authors found that non-wage costs exceed wage costs by 167 percent. This is more than triple the 50 percent non-wage costs amount I use, discussed above. Also see Smith, David A., Stan V. Smith, and Stephanie R. Uhl, "Estimating the Value of Family Household Management Services: Approaches and Markups," <u>Forensic Rehabilitation & Economics</u>, Vol 3, No. 2, 2010, pp. 85-94. According to this research, the statistical probability is 99 percent that the non-wage costs exceed 250 percent of the wage cost. The use of only a 50 percent non-wage cost makes my estimate very conservative, and it far more than compensates for two possible variations: variations in the national wage depending on locality, and variations in different types of services actually performed in the household. if one or more of the different types of services are not performed, and even if the services are provided in low wage areas, my use of the low, 50 percent non-wage costs more than compensates for these factors.

According to Merry Maids, a national home cleaning service agency, the charges for their services within the largest 100 Metropolitan Statistical Areas with populations of 500,000 and up range from \$40 to \$65 per hour, averaging \$49 per hour, in 2012. This hourly rate reflects non-wage costs of 250 percent of wages, and after adjusting for market factors, is four times the non-wage costs figure that I use, resulting in an hourly rate of more than double the rate that I use. Thus my use of only a 50 percent addition for non-wage costs is, in fact, very conservative. The hourly value of these services grows at the same rate as the wage growth rate discussed above.

Based on these assumptions, and Christine Snyder's life expectancy of 82.2 years, my opinion of the loss of the value of housekeeping and household management services is \$1,268,510 ▶ Table 12.

#### III. LOSS OF VALUE OF LIFE

Tables 13 through 15 show the loss of the value of life. Economists have long agreed that life is valued at more than the lost earnings capacity. My estimate of the value of life is based on many economic studies on what we, as a contemporary society, actually pay to preserve the ability to lead a normal life. The studies examine incremental pay for risky occupations as well as a multitude of data regarding expenditure for life savings by individuals, industry, and state and federal agencies. Based on the average value of a statistical life and life expectancy of 82.2 years, my opinion of the loss of the value of life for Christine Snyder is \$6,031,892 ▶ Table 15.

My estimate of the value of life is consistent with estimates published in other studies that examine and review the broad spectrum of economic literature on the value of life. Among these is "The Plausible Range for the Value of Life," Journal of Forensic Economics, Vol. 3, No. 3, Fall 1990, pp. 17-39, by T. R. Miller. This study reviews 67 different estimates of the value of life published by economists in peer-reviewed academic journals. The Miller results, in most instances, show the value of life to range from approximately \$1.6 million to \$2.9 million dollars in year 1988 after-tax dollars, with a mean of approximately \$2.2 million dollars. In "The Value of Life: Estimates with Risks by Occupation and Industry, " Economic <u>Inquiry</u>, Vol. 42, No. 1, May 2003, pp. 29-48, Professor W. K. Viscusi estimates the value of life to be approximately \$4.7 million dollars in year 2000 dollars. An early seminal paper on the value of life was written by Richard Thaler and Sherwin Rosen, "The Value of Saving a Life: Evidence from the Labor Market." in N.E. Terlicky; (ed.), Household Production and Consumption. New York: Columbia University Press, 1975, pp. 265-The Meta-Analyses Appendix to this report reviews additional literature suggesting a value of life of approximately \$5.4 million in year 2008 dollars.

Because it is generally accepted by economists, the economic methodology for the valuation of life has been found to meet the <u>Daubert</u> and <u>Frye</u> standards by many courts, along with the Rules of Evidence in many states nationwide. My testimony on the value of life has been accepted in approximately 225 state and federal cases nationwide in approximately two-thirds of the states and two-thirds of the federal jurisdictions. Testimony has been accepted by U.S. district and appellate courts as well as in state circuit, appellate, and supreme courts. Proof of general acceptance and other standards is found in a discussion of the extensive references to the scientific economic peer-reviewed literature on the value of life listed in the **Value of Life** Appendix to this report.

The underlying, academic, peer-reviewed studies fall into two general groups: (1) consumer behavior and purchases of safety devices; (2) wage risk premiums to workers; in addition, there is a third group of studies consisting of cost-benefit analyses of regulations. For example, one consumer safety study analyzes the costs of smoke detectors and the lifesaving reduction associated with them. One wage premium study examines the differential rates of pay for dangerous occupations with a risk of death on the job. Just as workers receive shift premiums for undesirable work hours, workers also receive a higher rate of pay to accept a increased risk of death on the job. A study of government regulation examines the lifesaving resulting from the installation of smoke stack scrubbers at high-sulphur, coalburning power plants. As a hypothetical example of the methodology, assume that a safety device such as a carbon

monoxide detector costs \$46 and results in lowering a person's risk of premature death by one chance in 100,000. The cost per life saved is obtained by dividing \$46 by the one in 100,000 probability, yielding \$4,600,000. Overall, based on the peer-reviewed economic literature, I estimate the central tendency of the range of the economic studies to be approximately \$4.9 million in year 2019 dollars.

Other factors may be weighed to determine if these estimated losses for Christine Snyder should be adjusted because of special qualities or circumstances that economists do not as yet have a methodology for analysis.

In each set of tables, the estimated losses are calculated from September 11, 2001 through an assumed trial or resolution date of January 1, 2020, and from that date thereafter. The last table in each set accumulates the past and future estimated losses. These estimates are provided as a tool, an aid, and a guide to assist the evaluation by others.

All opinions expressed in this report are clearly labeled as such. They are rendered in accordance with generally accepted standards within the field of economics and are expressed to a reasonable degree of economic certainty. Estimates, assumptions, illustrations and the use of benchmarks, which are not opinions, but which can be viewed as hypothetical in nature, are also clearly disclosed and identified herein.

In my opinion, it is reasonable for experts in the field of economics and finance to rely on the materials and information I reviewed in this case for the formulation of my substantive opinions herein.

If additional information is provided to me, which could alter my opinions, I may incorporate any such information into an update, revision, addendum, or supplement of the opinions expressed in this report.

If you have any questions, please do not hesitate to call me.

Sincerely,

Stan V. Smith, Ph.D.

Stan V. Smil

President

#### APPENDIX: HOUSEHOLD SERVICES VALUATION

Courts have long recognized claims for the value of tangible household family services as an element of damages in personal injury and wrongful death cases, as an aspect of the pecuniary loss in such cases. These services are those that are provided by the injured family member to himself or herself and to other family members, without charge or cost. Other family members who may receive such services can include spouses, children, parents or siblings; such family members do not necessarily have to reside in the same household to receive such services.

Economists and courts have also long recognized that an appropriate method in valuing such tangible services is to value their estimated market-based costs by examining costs paid in labor markets that provide generally comparable services for. Thus, economists can value the service by looking at market equivalents from which a pecuniary standard can be established. This approach is set forth in the 1913 U.S.Supreme Court Decision, Michigan Central Railroad Company v. Vreeland, 227 U.S. 59 (1913). So this method is a century old.

The Supreme Court's suggesting in valuing compensable services in the Vreeland decision is a standard that is not rigid, but actually rather general: "[The] pecuniary loss or damage must be one which can be measured by some standard.... Compensation for such loss manifestly does not include damages by way of recompense for grief or wounded feelings." Michigan Central v. Vreeland.

Examples of lost household services that used to be performed by persons (whether fatally or non-fatally injured) can include physical chores such as mowing the lawn, painting the house, cleaning the windows, doing the laundry, washing and repairing the car, preparing the meals and doing the dishes, among others. For many decades economists have met the Supreme Court's general standard by using labor market equivalents for cooks, laundry workers, gardeners, maids, etc. in valuing the physical chores regarding housekeeping services.

Additionally, economists have recognized that tangible services to family members include services well beyond the physical housekeeping chores. For example, William G. Jungbauer and Mark J. Odegard, in Maximizing Recovery in FELA Wrongful Death Actions, in Assessing Family Loss in Wrongful Death Litigation: The Special Roles of Lost Services and Personal Consumption, Lawyers & Judges Publishing Co., 1999, pp. 284, indicate that a complete analysis of all services performed by family members includes much, much more than the physical housekeeping chores. Frank D. Tinari, in a peer-reviewed, scientific, economic journal article "Household Services: Toward a More Comprehensive Measure," Journal of Forensic Economics, Vol. 11, No. 3, Fall

1998, pp. 253-265, expresses the same view. Dr. Tinari has been a tenured Professor at Seton Hall University, and is a former president of the National Association of Forensic Economics. There has been no peer-reviewed critique of this article since it appeared.

Jungbauer and Odegard indicate that a person may have provided services of many other professions such as that of a chauffeur, driving other family members to appointments, or that of a security guard, especially regarding the injury to a male spouse, Every family member acts as a companion to other family members. And it is common for family members to act as counselors for one another, typically providing advice and counsel on important personal, family, medical, financial, career or other issues. The marketplace can and does value such items of loss. If the person cannot provide these services, or does so at a reduced capacity or rate, there is a distinct and definite loss to the other family members. These losses have a definite and easily measurable pecuniary value. <u>Vreeland</u> requires only that a "reasonable expectation" of loss of services be proven and that such loss be valued by some standard, presumably a reasonably-based economic standard, to allow recovery.

The economic literature on recovery of loss of services discusses an estimated market-oriented valuation cost method to assess the pecuniary value of the loss of accompaniment services, as well as the value of advice, guidance and counsel services that family members provide to one another, within a broadly defined scope of family services. See, for example, Frank D. Tinari, "Household Services: Toward a More Comprehensive Measure, " <u>Journal of Forensic Economics</u>, Vol. 11, No. 3, Fall 1998, pp. 253-265.

Finally, according to Chief Justice Robert Wilentz of the Supreme Court of New Jersey, in <u>Green v. Bittner</u>, 85 NJ 1, 1980, pp. 12, accompaniment services, to be compensable, must be that which would have provided services substantially equivalent to those provided by the companions often hired today by the aged or infirm, or substantially equivalent to services provided by nurses or practical nurses; and its value must be confined to what the marketplace would pay a stranger with similar qualifications for performing such services.

In valuing the household services that are provided by family members to one another, beyond the physical housekeeping chores, both the U.S Supreme Court and the New Jersey Supreme Court discuss looking at labor markets for the equivalent value of such services. This methodology is identical to the traditional approach that economists have been using for over four decades in valuing the physical chores involved in housekeeping services. 5206

#### APPENDIX: VALUE OF LIFE

The economic methodology for the valuation of life has been found to meet the <u>Daubert</u> and <u>Frye</u> standards by many courts, along with the Rules of Evidence in many states nationwide. My testimony on the value of life has been accepted in approximately 225 state and federal cases nationwide in approximately two-thirds of the states and two-thirds of the federal jurisdictions. Testimony has been accepted by U.S. district and appellate courts as well as in state circuit, appellate, and supreme courts. The <u>Daubert</u> standard sets forth four criteria:

- 1. Testing of the theory and science
- 2. Peer Review
- 3. Known or potential rate of error
- 4. Generally accepted.

Testing of the theory and science has been accomplished over the past four decades, since the 1960s. Dozens of economists of high renown have published over a hundred articles in high quality, peer-reviewed economic journals measuring the value of life. The value of life theories are perhaps among the most well-tested in the field of economics, as evidenced by the enormous body of economic scientific literature that has been published in the field and is discussed below.

Peer Review of the concepts and methodology have been extraordinarily extensive. One excellent review of this extensive, peer-reviewed literature can be found in "The Value of Risks to Life and Health, " W. K. Viscusi, <u>Journal of Economic</u> Literature, Vol. 31, December 1993, pp. 1912-1946. A second is "The Value of a Statistical Life: A Critical Review of Market Estimates throughout the World. " W. K. Viscusi and J. E. Aldy, Journal of Risk and Uncertainty, Vol. 27, No. 1, November 2002, pp. 5-76. Additional theoretical and empirical work by Viscusi, a leading researcher in the field, can be found in: "The Value of Life", W. K. Viscusi, John M. Olin Center for Law, Economics, and Business, Harvard Law School, Discussion Paper No. 517, June 2005. An additional peer-reviewed article discusses the application to forensic economics: "The Plausible Range for the Value of Life, " T. R. Miller, Journal of Forensic Economics, Vol. 3, No. 3, Fall 1990, pp. 17-39, which discusses the many dozens of articles published in other peer-reviewed economic journals on this topic. This concept is discussed in detail in "Willingness to Pay Comes of Age: Will the System Survive?" T. R. Miller, Northwestern University Law Review, Summer 1989, pp. 876-907, and "Hedonic Damages in Personal Injury and Wrongful Death

Litigation, "by Stan V. Smith in Gaughan and Thornton, eds., Litigation Economics, Contemporary Studies in Economic and Financial Analysis, Vol. 74, pp. 39-59, JAI Press, Greenwich, CT, 1993. Kenneth Arrow, a Nobel Laureate in economics, discusses this method for valuing life in "Invaluable Goods," Journal of Economic Literature, Vol. 35, No. 2, 1997, pp. 759. See the Meta-Analyses Appendix for an additional review of the literature.

The known or potential rate of error is well researched. All of these articles discuss the known or potential rate of error, well within the acceptable standard in the field of economics, generally using a 95% confidence rate for the statistical testing and acceptance of results. There are few areas in the field of economics where the known or potential rate of error has been as well-accepted and subject to more extensive investigation.

General Acceptance of the concepts and methodology on the value of life in the field of economics is extensive. This methodology is and has been generally accepted in the field of economics for many years. Indeed, according to the prestigious and highly-regarded research institute, The Rand Corporation, by 1988, the peer-reviewed scientific methods for estimating the value of life were well-accepted: "Most economists would agree that the willingness-to-pay methodology is the most conceptually appropriate criterion for establishing the value of life,"

Computing Economic loss in Cases of Wrongful Death, King and Smith, Rand Institute for Civil Justice, R-3549-ICJ, 1988.

While first discussed in cutting edge, peer-reviewed economic journals, additional proof of general acceptance is now indicated by the fact that this methodology is now taught in standard economics courses at the undergraduate and graduate level throughout hundreds of colleges and universities nationwide as well as the fact that it is taught and discussed in widelyaccepted textbooks in the field of law and economics: Economics, Sixth Edition, David C. Colander, McGraw-Hill Irwin, Boston, 2006, pp. 463-465; this introductory economics textbook is the third most widely used textbook in college courses nationwide. Hamermesh and Rees's The Economics of Work and Pay, Harper-Collins, 1993, Chapter 13, a standard advanced textbook in labor economics, also discusses the methodology for valuing life. Other textbooks discuss this topic as well. Richard Posner, Judge and former Chief Judge of the U.S. Court of Appeals for the highly regarded 7th Circuit and Senior Lecturer at the University of Chicago Law School, one of most prolific legal writers in America, details the Value of Life approach in his widely used textbooks: Economic Analysis of Law, 1986, Little Brown & Co., pp. 182-185 and Tort Law, 1982, Little Brown & Co., pp. 120-126.

As further evidence of general acceptance in the field, some surveys (albeit non-scientific) published in the field of

forensic economics show that hundreds of economists nationwide are now familiar with this methodology and are available to prepare (and critique) forensic economic value of life estimates. Indeed, some economists who indicate they will prepare such analysis for plaintiffs also are willing to critique such analysis for defendants, as I have done. That an economist is willing to critique a report does not indicate that he or she is opposed to the concept or the methodology, but merely available to assure that the plaintiff economist has employed proper techniques. The fact that there are economists who indicate they do not prepare estimates of value of life is again no indication that they oppose the methodology: many claim they are not familiar with the literature and untrained in this area. While some CPAs and others without a degree in economics have opposed these methods, such professionals do not have the requisite academic training and are unqualified to make such judgements. However, as in any field of economics, this area is not without any dissent. General acceptance does not mean universal acceptance.

Additional evidence of general acceptance in the field is found in the teaching of the concepts regarding the value of life. Forensic Economics is now taught as a special field in a number of institutions nationwide. I taught what is believed to be the first course ever presented in the field of Forensic Economics at DePaul University in Spring, 1990. My own book, Economic/Hedonic Damages, Anderson, 1990, and supplemental updates thereto, coauthored with Dr. Michael Brookshire, a Professor of Economics in West Virginia, has been used as a textbook in at least 5 colleges and universities nationwide in such courses in economics, and has a thorough discussion of the methodology. Toppino et. al., in "Forensic Economics in the Classroom," published in The Earnings Analyst, Journal of the American Rehabilitation Economics Association, Vol. 4, 2001, pp. 53-86, indicate that hedonic damages is one of 15 major topic areas taught in such courses.

Lastly, general acceptance is found by examining publications in the primary journal in the field of Forensic Economics, which is the peer-reviewed Journal of Forensic Economics, where there have been published many articles on the value of life. Some are cited above. Others include: "The Econometric Basis for Estimates of the Value of Life," W. K. Viscusi, Vol 3, No. 3, Fall 1990, pp. 61-70; "Hedonic Damages in the Courtroom Setting." Stan V. Smith, Vol. 3, No. 3, Fall 1990, pp. 41-49; "Issues Affecting the Calculated Value of Life," E. P. Berla, M. L. Brookshire and Stan V. Smith, Vol 3, No. 1, 1990, pp. 1-8; "Hedonic Damages and Personal Injury: A Conceptual Approach." G. R. Albrecht, Vol. 5., No. 2, Spring/Summer 1992, pp. 97-104; "The Application of the Hedonic Damages Concept to Wrongful and Personal Injury Litigation." G. R. Albrecht, Vol. 7, No. 2, Spring/Summer 1994, pp. 143-150; and also "A Review of the Monte Carlo Evidence Concerning Hedonic Value of Life Estimates," R. F.

Gilbert, Vol. 8, No. 2, Spring/Summer 1995, pp. 125-130. Professor Ike Mathur, while Chairman of the Department of Finance at Southern Illinois University wrote an article on how the value of life studies can be used to provide a basis for estimating the value of life per year in application to litigation. This article corroborates my approach: "Estimating Value of Life per Life Year." I. Mathur, Journal of Forensic Economics, Vol. 3, No. 3, 1990, pp. 95-96. As do many of the authors of applications of the value of life literature to litigation economics, Professor Mathur has frequently testified in court, and courts have admitted his testimony.

It is important to note that this methodology is endorsed and employed by the U. S. Government as the standard and recommended approach for use by all U. S. Agencies in valuing life for policy purposes, as mandated in current and past Presidential Executive Orders in effect since 1972, and as discussed in "Report to Congress on the Costs and Benefits of Federal Regulations," Office of Management and Budget, 1998, and "Economic Analysis of Federal Regulations Under Executive Order 12866," Executive Office of the President, Office of Management and Budget, pp. 1-37, and "Report to the President on Executive Order No. 12866," Regulatory Planning and Review, May 1, 1994, Office of Information and Regulatory Affairs, Office of Management and Budget. Prior presidents signed similar orders as discussed in "Federal Agency Valuations of Human life," Administrative Conference of the United States, Report for Recommendation 88-7, December 1988, pp. 368-408. 926

#### APPENDIX: META-ANALYSES AND VALUE OF LIFE RESULTS SINCE 2000

Below I list the principal systematic reviews (meta-analyses), since the year 2000, of the value of life literature, and the values of a statistical life that they recommend. In statistics, a meta-analysis combines the results of several studies that address a set of related research hypotheses. Meta-analysis increase the statistical power of studies by analyzing a group of studies and provide a more powerful and accurate data analysis than would result from analyzing each study alone. Based on those reviews, the Summary Table suggests a best estimate. The following table summarizes the studies and their findings.

These statistically based studies place the value between \$4.4 and \$7.5 million, with \$5.9 million in year 2005 dollars representing a conservative yet credible estimate of the average (and range midpoint) of the values of a statistical life published in the studies in year 2005 dollars. Net of human capital, a credible net value of life based on all these literature reviews to be \$4.8 million in year 2005 dollars, or \$5.4 million in year 2008 dollars.

The actual value that I use, \$4.1 million in year 2008 dollars (\$4.9 million in year 2019 dollars) is approximately 24 percent lower than a conservative average estimate based on the credible meta-analyses. This value was originally based on a review conducted in the late 1980s, averaging the results published by that time. I have increased that late 1980s value only by inflation over time, despite the fact a review of literature over the years since that time has put obvious upward pressure on the figure that I use.

#### VALUE OF STATISTICAL LIFE SUMMARY TABLE

Mean and range of value of statistical life estimates (in 2005 dollars) from the best meta-analyses and systematic reviews since 2000 and characteristics of those reviews.

Study	Formal Meta- Analysis?	Number of Values	Best Estimate (2005 Dollars)	Range	Context
Miller 2000	Yes	68 estimates	\$5.1M	\$4.5- \$6.2M	US estimate from all
Mrozek & Taylor 2002	Yes	203 estimates	\$4.4M	+ or = 35%	Labor market
Viscusi & Aldy 2003	Yes	49 estimates	\$6.5M	\$5.1- \$9.6M	Labor market, US estimate from all
Kochi et al. 2006	Yes	234 estimates	\$6.0M	+ or - 44%	Labor market survey
Bellavance 2006 (published in 2009)	Yes	37 estimates	\$7.5M	+ or =	Labor market

Adapted from Ted R. Miller's paper "Hedonic Damages," <u>Journal of Forensic Economics</u>, Vol. 20, No. 2 (October 2008), pp. 137-153.

Miller (2000) started from the Miller 1989 JFE estimates and used statistical methods to adjust for differences between studies. It also added newer studies, primarily ones outside the United States. The authors specified the most appropriate study approach a priori, which allowed calculation of a best estimate from the statistical regression. Miller, Ted R, "Variations between Countries in Values of Statistical Life", <u>Journal of Transport Economics and Policy</u>, Vol. 34, No. 2 (May 2000), pp. 169-188.

Mrozek and Taylor (2002) searched intensively for studies of the value of life implied by wages paid for risky jobs. They coded all values from each study rather than a most appropriate estimate. A statistical analysis identified what factors accounted for the differences in values between studies. The authors specified the most appropriate study approach a priori, which allowed calculation of a best estimate from the statistical regression. Mrozek, Janusz R. and Laura O. Taylor, "What Determines the Value of Life? A Meta-Analysis", Journal of Policy Analysis and Management, Vol. 21, No. 2 (2002), pp. 253-270.

Viscusi and Aldy (2003) focused on values from labor market studies that they considered of high quality and that provided data on risk levels and other important explanatory variables. They used statistical methods to account for variations between studies and derive a best estimate. W.K. Viscusi and J.E. Aldy, "The Value of a Statistical Life: A Critical Review of Market Estimates Throughout the World", <u>Journal of Risk and Uncertainty</u>, Vol. 27, No. 1 (2003), pp. 5-76.

Kochi et al. (2006) searched intensively for studies of the value of life implied by wages and coded all values from each study rather than a most appropriate estimate. They did not filter study quality carefully. The best estimate was derived by statistical methods based on the distribution of the values within and across studies. Kochi, Ikuho, Bryan Hubbell, and Randall Kramer, "An Empirical Bayes Approach to Combining and Comparing Estimates of the Value of a Statistical Life for Environmental Policy Analysis", Environmental and Resource Economics, Vol. 34 (2006), pp. 385-406.

Bellavance et al. (2009) focused on values from labor market studies that they considered of high quality and that provided data on risk levels and other important explanatory variables. They used statistical methods to account for variations between studies and derive a best estimate. Bellavance, Francois, Georges Dionne, and Martin Lebeau, "The Value of a Statistical Life: A Meta-Analysis with a Mixed Effects Regression Model," Journal of Health Economics, Vol. 28, Issue 2, (2009), pp. 444-464. 3A22

#### SUMMARY OF LOSSES FOR CHRISTINE SNYDER

TABLE ****	DESCRIPTION *********	ESTIMATE *******
	EARNINGS	
	LOSS OF WAGES & BENEFITS, NET OF PERSONAL CONSUMPTION	to 074 045
9	Annual Employment to age 67	\$3,274,045
	HOUSEHOLD/FAMILY SERVICES	-
12	LOSS OF HOUSEHOLD/FAMILY HOUSEKEEPING AND HOME MANAGEMENT SERVICES	\$1,268,510
	LOSS OF ENJOYMENT OF LIFE	=
15	LOSS OF VALUE OF LIFE	\$6,031,892

The information on this Summary of Losses is intended to summarize losses under certain given assumptions. Please refer to the report and the tables for all the opinions.

LOSS OF PAST WAGES 2001 - 2019

YEAR	AGE	WAGES	CUMULATE
***	***	*****	*****
2001	32	\$12,164	\$12,164
2002	33	44,259	56,423
2003	34	48,751	105,174
2004	35	53,263	158,437
2005	36	58,278	216,715
2006	37	62,090	278,805
2007	38	67,107	345,912
2008	39	68,846	414,758
2009	40	72,441	487,199
2010	41	75,336	562,535
2011	42	79,451	641,986
2012	43	82,820	724,806
2013	44	86,135	810,941
2014	45	88,940	899,881
2015	46	91,812	991,693
2016	47	96,012	1,087,705
2017	48	100,437	1,188,142
2018	49	104,867	1,293,009
2019	50	109,586	\$1,402,595
SYNDER	}	\$1,402,595	

LOSS OF PAST EMPLOYEE BENEFITS 2001 - 2019

		EMPLOYEE	
YEAR	AGE	BENEFITS	CUMULATE
***	***	*****	*****
2001	32	\$2,846	\$2,846
2002	33	10,357	13,203
2003	34	11,408	24,611
2004	35	12,464	37,075
2005	36	13,637	50,712
2006	37	14,529	65,241
2007	38	15,703	80,944
2008	39	16,110	97,054
2009	40	16,951	114,005
2010	41	17,629	131,634
2011	42	18,592	150,226
2012	43	19,380	169,606
2013	44	20,156	189,762
2014	45	20,812	210,574
2015	46	21,484	232,058
2016	47	22,467	254,525
2017	48	23,502	278,027
2018	49	24,539	302,566
2019	50	25,643	\$328,209
SYNDER		\$328,209	

LOSS OF PAST PERSONAL CONSUMPTION 2001 - 2019

		PERSONAL	
YEAR	AGE	CONSUMPTION	CUMULATE
****	***	*******	*****
2001	32	-\$2,897	-\$2,897
2002	33	-10,542	-13,439
2003	34	-11,612	-25,051
2004	35	-12,687	-37,738
2005	36	-13,882	-51,620
2006	37	-14,790	-66,410
2007	38	-15,985	-82,395
2008	39	-16,399	-98,794
2009	40	-17,255	-116,049
2010	41	-17,945	-133,994
2011	42	-18,925	-152,919
2012	43	-19,728	-172,647
2013	44	-20,517	-193,164
2014	45	-21,186	-214,350
2015	46	-21,870	-236,220
2016	47	-22,870	-259,090
2017	48	-23,924	-283,014
2018	49	-24,979	-307,993
2019	50	-26,103	-\$334,096
SYNDE	₹	-\$334,096	

# Case 1:03-md-01570-GBD-SN Document 5034-16 Filed 08/31/19 Page 23 of 37 Table 4

## ECONOMIC LOSS TO DATE 2001 - 2019

			EMPLOYEE	PERSONAL		
YEAR	AGE	WAGES	BENEFITS	CONSUMPTION	TOTAL	CUMULATE
****	***	******	*****	******	******	******
2001	32	\$12,164	\$2,846	-\$2,897	\$12,113	\$12,113
2002	33	44,259	10,357	-10,542	44,074	56,187
2003	34	48,751	11,408	-11,612	48,547	104,734
2004	35	53,263	12,464	-12,687	53,040	157,774
2005	36	58,278	13,637	-13,882	58,033	215,807
2006	37	62,090	14,529	-14,790	61,829	277,636
2007	38	67,107	15,703	-15,985	66,825	344,461
2008	39	68,846	16,110	-16,399	68,557	413,018
2009	40	72,441	16,951	-17,255	72,137	485,155
2010	41	75,336	17,629	-17,945	75,020	560,175
2011	42	79,451	18,592	-18,925	79,118	639,293
2012	43	82,820	19,380	-19,728	82,472	721,765
2013	44	86,135	20,156	-20,517	85,774	807,539
2014	45	88,940	20,812	-21,186	88,566	896,105
2015	46	91,812	21,484	-21,870	91,426	987,531
2016	47	96,012	22,467	-22,870	95,609	1,083,140
2017	48	100,437	23,502	-23,924	100,015	1,183,155
2018	49	104,867	24,539	-24,979	104,427	1,287,582
2019	50	109,586	25,643	-26,103	109,126	\$1,396,708
SYNDER		\$1,402,595	\$328,209	-\$334,096	\$1,396,708	

## Case 1:03-md-01570-GBD-SN Document 5034-16 Filed 08/31/19 Page 24 of 37 Table 5

## PRESENT VALUE OF FUTURE WAGES 2020 - 2051

			DISCOUNT	PRESENT	
YEAR	AGE	WAGES	FACTOR	VALUE	CUMULATE
****	***	*****	*****	******	******
2020	51	\$114,517	0.98765	\$113,103	\$113,103
2021	52	115,662	0.97546	112,824	225,927
2022	53	116,819	0.96342	112,546	338,473
2023	54	117,987	0.95152	112,267	450,740
2024	55	119,167	0.93978	111,991	562,731
2025	56	120,359	0.92817	111,714	674,445
2026	57	121,563	0.91672	111,439	785,884
2027	58	122,779	0.90540	111,164	897,048
2028	59	124,007	0.89422	110,890	1,007,938
2029	60	125,247	0.88318	110,616	1,118,554
2030	61	126,499	0.87228	110,343	1,228,897
2031	62	127,764	0.86151	110,070	1,338,967
2032	63	129,042	0.85087	109,798	1,448,765
2033	64	130,332	0.84037	109,527	1,558,292
2034	65	131,635	0.82999	109,256	1,667,548
2035	66	132,951	0.81975	108,987	1,776,535
2036	67	134,281	0.80963	108,718	1,885,253
2037	68	135,624	0.79963	108,449	1,993,702
2038	69	136,980	0.78976	108,181	2,101,883
2039	70	138,350	0.78001	107,914	2,209,797
2040	71	139,734	0.77038	107,648	2,317,445
2041	72	141,131	0.76087	107,382	2,424,827
2042	73	142,542	0.75147	107,116	2,531,943
2043	74	143,967	0.74220	106,852	2,638,795
2044	75	145,407	0.73303	106,588	2,745,383
2045	76	146,861	0.72398	106,324	2,851,707
2046	77	148,330	0.71505	106,063	2,957,770
2047	78	149,813	0.70622	105,801	3,063,571
2048	79	151,311	0.69750	105,539	3,169,110
2049	80	152,824	0.68889	105,279	3,274,389
2050	81	154,352	0.68038	105,018	3,379,407
2051	82	126,425	0.67356	85,155	\$3,464,562

CHRISTINE SYNDER

\$3,464,562

## Case 1:03-md-01570-GBD-SN Document 5034-16 Filed 08/31/19 Page 25 of 37 Table 6

PRESENT VALUE OF FUTURE EMPLOYEE BENEFITS
2020 - 2051

		EMPLOYEE	DISCOUNT	PRESENT	
YEAR	AGE	BENEFITS	FACTOR	VALUE	CUMULATE
***	***	*****	*****	*****	*****
2020	51	\$26,797	0.98765	\$26,466	\$26,466
2021	52	27,065	0.97546	26,401	52,867
2022	53	27,336	0.96342	26,336	79,203
2023	54	27,609	0.95152	26,271	105,474
2024	55	27,885	0.93978	26,206	131,680
2025	56	28,164	0.92817	26,141	157,821
2026	57	28,446	0.91672	26,077	183,898
2027	58	28,730	0.90540	26,012	209,910
2028	59	29,018	0.89422	25,948	235,858
2029	60	29,308	0.88318	25,884	261,742
2030	61	29,601	0.87228	25,820	287,562
2031	62	29,897	0.86151	25,757	313,319
2032	63	30,196	0.85087	25,693	339,012
2033	64	30,498	0.84037	25,630	364,642
2034	65	30,803	0.82999	25,566	390,208
2035	66	31,111	0.81975	25,503	415,711
2036	67	31,422	0.80963	25,440	441,151
2037	68	31,736	0.79963	25,377	466,528
2038	69	32,053	0.78976	25,314	491,842
2039	70	32,374	0.78001	25,252	517,094
2040	71	32,698	0.77038	25,190	542,284
2041	72	33,025	0.76087	25,128	567,412
2042	73	33,355	0.75147	25,065	592,477
2043	74	33,688	0.74220	25,003	617,480
2044	75	34,025	0.73303	24,941	642,421
2045	76	34,365	0.72398	24,880	667,301
2046	77	34,709	0.71505	24,819	692,120
2047	78	35,056	0.70622	24,757	716,877
2048	79	35,407	0.69750	24,696	741,573
2049	80	35,761	0.68889	24,635	766,208
2050	81	36,118	0.68038	24,574	790,782
2051	82	29,583	0.67356	19,926	\$810,708

CHRISTINE SYNDER

\$810,708

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## PRESENT VALUE OF FUTURE PERSONAL CONSUMPTION 2020 - 2051

		PERSONAL	DISCOUNT	PRESENT	
YEAR	AGE	CONSUMPTION	FACTOR	VALUE	CUMULATE
***	***	******	*****	******	******
2020	51	-\$27,278	0.98765	-\$26,941	-\$26,941
2021	52	-27,551	0.97546	-26,875	-53,816
2022	53	-27,826	0.96342	-26,808	-80,624
2023	54	-28,105	0.95152	-26,742	-107,366
2024	55	-28,386	0.93978	-26,677	-134,043
2025	56	-28,670	0.92817	-26,611	-160,654
2026	57	-28,956	0.91672	-26,545	-187,199
2027	58	-29,246	0.90540	-26,479	-213,678
2028	59	-29,538	0.89422	-26,413	-240,091
2029	60	-29,834	0.88318	-26,349	-266,440
2030	61	-30,132	0.87228	-26,284	-292,724
2031	62	-30,433	0.86151	-26,218	-318,942
2032	63	-30,738	0.85087	-26,154	-345,096
2033	64	-31,045	0.84037	-26,089	-371,185
2034	65	-31,355	0.82999	-26,024	-397,209
2035	66	-31,669	0.81975	-25,961	-423,170
2036	67	-31,986	0.80963	-25,897	-449,067
2037	68	-32,306	0.79963	-25,833	-474,900
2038	69	-32,629	0.78976	-25,769	-500,669
2039	70	-32,955	0.78001	-25,705	-526,374
2040	71	-33,285	0.77038	-25,642	-552,016
2041	72	-33,617	0.76087	-25,578	-577,594
2042	73	-33,954	0.75147	-25,515	-603,109
2043	74	-34,293	0.74220	-25,452	-628,561
2044	75	-34,636	0.73303	-25,389	-653,950
2045	76	-34,982	0.72398	-25,326	-679,276
2046	77	-35,332	0.71505	-25,264	-704,540
2047	78	-35,685	0.70622	-25,201	-729,741
2048	79	-36,042	0.69750	-25,139	-754,880
2049	80	-36,403	0.68889	-25,078	-779,958
2050	81	-36,767	0.68038	-25,016	-804,974
2051	82	-30,114	0.67356	-20,284	-\$825,258

CHRISTINE SYNDER

-\$825,258

## 

## PRESENT VALUE OF FUTURE WAGE AND BENEFIT LOSS 2020 - 2051

			EMPLOYEE	PERSONAL		
YEAR	AGE	WAGES	BENEFITS	CONSUMPTION	TOTAL	CUMULATE
****	***	******	*****	******	******	*****
2020	51	\$113,103	\$26,466	-\$26,941	\$112,628	\$112,628
2021	52	112,824	26,401	-26,875	112,350	224,978
2022	53	112,546	26,336	-26,808	112,074	337,052
2023	54	112,267	26,271	-26,742	111,796	448,848
2024	55	111,991	26,206	-26,677	111,520	560,368
2025	56	111,714	26,141	-26,611	111,244	671,612
2026	57	111,439	26,077	-26,545	110,971	782,583
2027	58	111,164	26,012	-26,479	110,697	893,280
2028	59	110,890	25,948	-26,413	110,425	1,003,705
2029	60	110,616	25,884	-26,349	110,151	1,113,856
2030	61	110,343	25,820	-26,284	109,879	1,223,735
2031	62	110,070	25,757	-26,218	109,609	1,333,344
2032	63	109,798	25,693	-26,154	109,337	1,442,681
2033	64	109,527	25,630	-26,089	109,068	1,551,749
2034	65	109,256	25,566	-26,024	108,798	1,660,547
2035	66	108,987	25,503	-25,961	108,529	1,769,076
2036	67	108,718	25,440	-25,897	108,261	1,877,337
2037	68	108,449	25,377	-25,833	107,993	1,985,330
2038	69	108,181	25,314	-25,769	107,726	2,093,056
2039	70	107,914	25,252	-25,705	107,461	2,200,517
2040	71	107,648	25,190	-25,642	107,196	2,307,713
2041	72	107,382	25,128	-25,578	106,932	2,414,645
2042	73	107,116	25,065	-25,515	106,666	2,521,311
2043	74	106,852	25,003	-25,452	106,403	2,627,714
2044	75	106,588	24,941	-25,389	106,140	2,733,854
2045	76	106,324	24,880	-25,326	105,878	2,839,732
2046	77	106,063	24,819	-25,264	105,618	2,945,350
2047	78	105,801	24,757	-25,201	105,357	3,050,707
2048	79	105,539	24,696	-25,139	105,096	3,155,803
2049	80	105,279	24,635	-25,078	104,836	3,260,639
2050	81	105,018	24,574	-25,016	104,576	3,365,215
2051	82	85,155	19,926	-20,284	84,797	\$3,450,012
SYNDE	R	\$3,464,562	\$810,708	-\$825,258	\$3,450,012	

## PRESENT VALUE OF NET WAGE AND BENEFIT LOSS 2001 - 2051

			EMPLOYEE	PERSONAL		
YEAR	AGE	WAGES	BENEFITS	CONSUMPTION	TOTAL	CUMULATE
****	***	*****	*****	******	*****	*****
2001	32	\$12,164	\$2,846	-\$2,897	\$12,113	\$12,113
2002	33	44,259	10,357	-10,542	44,074	56,187
2003	34	48,751	11,408	-11,612	48,547	104,734
2004	35	53,263	12,464	-12,687	53,040	157,774
2005	36	58,278	13,637	-13,882	58,033	215,807
2006	37	62,090	14,529	-14,790	61,829	277,636
2007	38	67,107	15,703	-15,985	66,825	344,461
2008	39	68,846	16,110	-16,399	68,557	413,018
2009	40	72,441	16,951	-17,255	72,137	485,155
2010	41	75,336	17,629	-17,945	75,020	560,175
2011	42	79,451	18,592	-18,925	79,118	639,293
2012	43	82,820	19,380	-19,728	82,472	721,765
2013	44	86,135	20,156	-20,517	85,774	807,539
2014	45	88,940	20,812	-21,186	88,566	896,105
2015	46	91,812	21,484	-21,870	91,426	987,531
2016	47	96,012	22,467	-22,870	95,609	1,083,140
2017	48	100,437	23,502	-23,924	100,015	1,183,155
2018	49	104,867	24,539	-24,979	104,427	1,287,582
2019	50	109,586	25,643	-26,103	109,126	1,396,708
2020	51	113,103	26,466	-26,941	112,628	1,509,336
2021	52	112,824	26,401	-26,875	112,350	1,621,686
2022	53	112,546	26,336	-26,808	112,074	1,733,760
2023	54	112,267	26,271	-26,742	111,796	1,845,556
2024	55	111,991	26,206	-26,677	111,520	1,957,076
2025	56	111,714	26,141	-26,611	111,244	2,068,320
2026	57	111,439	26,077	-26,545	110,971	2,179,291
2027	58	111,164	26,012	-26,479	110,697	2,289,988
2028	59	110,890	25,948	-26,413	110,425	2,400,413
2029	60	110,616	25,884	-26,349	110,151	2,510,564
2030	61	110,343	25,820	-26,284	109,879	2,620,443
2031	62	110,070	25,757	-26,218	109,609	2,730,052
2032	63	109,798	25,693	-26,154	109,337	2,839,389
2033	64	109,527	25,630	-26,089	109,068	2,948,457
2034	65	109,256	25,566	-26,024	108,798	3,057,255
2035	66	108,987	25,503	-25,961	108,529	3,165,784
2036	67	108,718	25,440	-25,897	108,261	3,274,045
2037	68	108,449	25,377	-25,833	107,993	3,382,038
2038	69	108,181	25,314	-25,769	107,726	3,489,764
2039	70	107,914	25,252	-25,705	107,461	3,597,225
2040	71	107,648	25,190	-25,642	107,196	3,704,421
2041	72	107,382	25,128	-25,578	106,932	3,811,353
2042	73	107,116	25,065	-25,515	106,666	3,918,019
2043	74	106,852	25,003	-25,452	106,403	4,024,422
2044	75	106,588	24,941	-25,389	106,140	4,130,562
2045	76	106,324	24,880	-25,326	105,878	4,236,440
2046	77	106,063	24,819	-25,264	105,618	4,342,058
2047	78	105,801	24,757	-25,201	105,357	4,447,415
2048	79	105,539	24,696	-25,139	105,096	4,552,511
2049	80	105,279	24,635	-25,078	104,836	4,657,347
2050	81	105,018	24,574	-25,016	104,576	4,761,923

## 

## PRESENT VALUE OF NET WAGE AND BENEFIT LOSS 2001 - 2051

YEAR **** 2051	AGE *** 82	WAGES ******** 85,155	EMPLOYEE BENEFITS ******** 19,926	PERSONAL CONSUMPTION ******** -20,284	TOTAL ******** 84,797	CUMULATE ******* \$4,846,720
SYNDE	₹	\$4,867,157	\$1,138,917	-\$1,159,354	\$4,846,720	

LOSS OF PAST HOUSEHOLD SERVICES 2001 - 2019

		HOUSEHOLD	
YEAR	AGE	SERVICES	CUMULATE
****	***	*****	*****
2001	32	\$4,393	\$4,393
2002	33	14,742	19,135
2003	34	15,519	34,654
2004	35	16,203	50,857
2005	36	16,696	67,553
2006	37	17,346	84,899
2007	38	18,054	102,953
2008	39	18,585	121,538
2009	40	18,780	140,318
2010	41	19,011	159,329
2011	42	19,109	178,438
2012	43	20,230	198,668
2013	44	20,230	218,898
2014	45	20,749	239,647
2015	46	21,260	260,907
2016	47	21,714	282,621
2017	48	22,369	304,990
2018	49	23,023	328,013
2019	50	23,713	\$351,726
SYNDER		\$351,726	

PRESENT VALUE OF FUTURE HOUSEHOLD SERVICES 2020 - 2051

		HOUSEHOLD	DISCOUNT	PRESENT	
YEAR	AGE	SERVICES	FACTOR	VALUE	CUMULATE
****	***	*****	*****	*****	*****
2020	51	\$24,425	0.98765	\$24,123	\$24,123
2021	52	24,669	0.97546	24,064	48,187
2022	53	24,916	0.96342	24,005	72,192
2023	54	25,165	0.95152	23,945	96,137
2024	55	25,417	0.93978	23,886	120,023
2025	56	25,671	0.92817	23,827	143,850
2026	57	25,928	0.91672	23,769	167,619
2027	58	26,187	0.90540	23,710	191,329
2028	59	26,449	0.89422	23,651	214,980
2029	60	26,713	0.88318	23,592	238,572
2030	61	26,980	0.87228	23,534	262,106
2031	62	27,250	0.86151	23,476	285,582
2032	63	27,523	0.85087	23,418	309,000
2033	64	27,798	0.84037	23,361	332,361
2034	65	28,076	0.82999	23,303	355,664
2035	66	28,357	0.81975	23,246	378,910
2036	67	28,641	0.80963	23,189	402,099
2037	68	44,199	0.79963	35,343	437,442
2038	69	44,641	0.78976	35,256	472,698
2039	70	45,087	0.78001	35,168	507,866
2040	71	45,538	0.77038	35,082	542,948
2041	72	45,993	0.76087	34,995	577,943
2042	73	46,453	0.75147	34,908	612,851
2043	74	46,918	0.74220	34,823	647,674
2044	75	47,387	0.73303	34,736	682,410
2045	76	47,861	0.72398	34,650	717,060
2046	77	48,340	0.71505	34,566	751,626
2047	78	48,823	0.70622	34,480	786,106
2048	79	49,311	0.69750	34,394	820,500
2049	80	49,804	0.68889	34,309	854,809
2050	81	50,302	0.68038	34,224	889,033
2051	82	41,201	0.67356	27,751	\$916,784

CHRISTINE SYNDER

\$916,784

PRESENT VALUE OF NET HOUSEHOLD SERVICES LOSS 2001 - 2051

		HOUSEHOLD	
YEAR	AGE	SERVICES	CUMULATE
****	***	*****	*****
2001	32	\$4,393	\$4,393
2002	33	14,742	19,135
2003	34	15,519	34,654
2004	35	16,203	50,857
2005	36	16,696	67,553
2006	37	17,346	84,899
2007	38	18,054	102,953
2008	39	18,585	121,538
2009	40	18,780	140,318
2010	41	19,011	159,329
2011	42	19,109	178,438
2012	43	20,230	198,668
2013	44	20,230	218,898
2014	45	20,749	239,647
2015	46	21,260	260,907
2016	47	21,714	282,621
2017	48	22,369	304,990
2018	49	23,023	328,013
2019	50	23,713	351,726
2020	51	24,123	375,849
2021	52	24,064	399,913
2022	53	24,005	423,918
2023	54	23,945	447,863
2024	55	23,886	471,749
2025	56	23,827	495,576
2026	57	23,769	519,345
2027	58	23,710	543,055
2028	59	23,651	566,706
2029	60	23,592	590,298
2030	61	23,534	613,832
2031	62	23,476	637,308
2032	63	23,418	660,726
2033	64	23,361	684,087
2034	65	23,303	707,390
2035	66	23,246	730,636
2036	67	23,189	753,825
2037	68	35,343	789,168
2038	69	35,256	824,424
2039	70	35,168	859,592
2040	71	35,082	894,674
2041	72	34,995	929,669
2042	73	34,908	964,577
2043	74	34,823	999,400
2044	75	34,736	1,034,136
2045	76	34,650	1,068,786
2046	77	34,566	1,103,352
2047	78	34,480	1,137,832
2048	79	34,394	1,172,226
2049	80	34,309	1,206,535
2050	81	34,224	1,240,759
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PRESENT VALUE OF NET HOUSEHOLD SERVICES LOSS 2001 - 2051

		HOUSEHOLD	
YEAR	AGE	SERVICES	CUMULATE
***	***	******	******
2051	82	27,751	\$1,268,510
SYNDER		\$1,268,510	

LOSS OF PAST LVL OF CHRISTINE 2001 - 2019

YEAR	AGE	LVL	CUMULATE
****	***	*****	*****
2001	32	\$29,936	\$29,936
2002	33	100,782	130,718
2003	34	102,677	233,395
2004	35	106,024	339,419
2005	36	109,650	449,069
2006	37	112,436	561,505
2007	38	117,023	678,528
2008	39	117,128	795,656
2009	40	120,314	915,970
2010	41	112,119	1,028,089
2011	42	125,734	1,153,823
2012	43	127,921	1,281,744
2013	44	129,840	1,411,584
2014	45	130,827	1,542,411
2015	46	131,782	1,674,193
2016	47	134,510	1,808,703
2017	48	137,348	1,946,051
2018	49	139,971	2,086,022
2019	50	142,771	\$2,228,793
SYNDER	3	\$2,228,793	

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## PRESENT VALUE OF FUTURE LVL OF CHRISTINE 2020 - 2051

			DISCOUNT	PRESENT	
YEAR	AGE	LVL	FACTOR	VALUE	CUMULATE
***	***	*****	*****	******	******
2020	51	\$145,626	0.98765	\$143,828	\$143,828
2021	52	145,626	0.97546	142,052	285,880
2022	53	145,626	0.96342	140,299	426,179
2023	54	145,626	0.95152	138,566	564,745
2024	55	145,626	0.93978	136,856	701,601
2025	56	145,626	0.92817	135,166	836,767
2026	57	145,626	0.91672	133,498	970,265
2027	58	145,626	0.90540	131,850	1,102,115
2028	59	145,626	0.89422	130,222	1,232,337
2029	60	145,626	0.88318	128,614	1,360,951
2030	61	145,626	0.87228	127,027	1,487,978
2031	62	145,626	0.86151	125,458	1,613,436
2032	63	145,626	0.85087	123,909	1,737,345
2033	64	145,626	0.84037	122,380	1,859,725
2034	65	145,626	0.82999	120,868	1,980,593
2035	66	145,626	0.81975	119,377	2,099,970
2036	67	145,626	0.80963	117,903	2,217,873
2037	68	145,626	0.79963	116,447	2,334,320
2038	69	145,626	0.78976	115,010	2,449,330
2039	70	145,626	0.78001	113,590	2,562,920
2040	71	145,626	0.77038	112,187	2,675,107
2041	72	145,626	0.76087	110,802	2,785,909
2042	73	145,626	0.75147	109,434	2,895,343
2043	74	145,626	0.74220	108,084	3,003,427
2044	75	145,626	0.73303	106,748	3,110,175
2045	76	145,626	0.72398	105,430	3,215,605
2046	77	145,626	0.71505	104,130	3,319,735
2047	78	145,626	0.70622	102,844	3,422,579
2048	79	145,626	0.69750	101,574	3,524,153
2049	80	145,626	0.68889	100,320	3,624,473
2050	81	145,626	0.68038	99,081	3,723,554
2051	82	118,097	0.67356	79,545	\$3,803,099

CHRISTINE SYNDER

\$3,803,099

PRESENT VALUE OF NET LVL OF CHRISTINE 2001 - 2051

YEAR	AGE	LVL	CUMULATE
****	***	*****	*******
2001	32	\$29,936	\$29,936
2002	33	100,782	130,718
2003	34	102,677	233,395
2004	35	106,024	339,419
2005	36	109,650	449,069
2006	37	112,436	561,505
2007	38	117,023	678,528
2008	39	117,128	795,656
2009	40	120,314	915,970
2010	41	112,119	1,028,089
2011	42	125,734	1,153,823
2012	43	127,921	1,281,744
2013	44	129,840	1,411,584
2014	45	130,827	1,542,411
2015	46	131,782	1,674,193
2016	47	134,510	1,808,703
2017	48	137,348	1,946,051
2018	49	139,971	2,086,022
2019	50	142,771	2,228,793
2020	51	143,828	2,372,621
2021	52	142,052	2,514,673
2022	53	140,299	2,654,972
2023	54	138,566	2,793,538
2024	55	136,856	2,930,394
2025	56	135,166	3,065,560
2026	57	133,498	3,199,058
2027	58	131,850	3,330,908
2028	59	130,222	3,461,130
2029	60	128,614	3,589,744
2030	61	127,027	3,716,771
2031	62	125,458	3,842,229
2032	63	123,909	3,966,138
2033	64	122,380	4,088,518
2034	65	120,868	4,209,386
2035	66	119,377	4,328,763
2036	67	117,903	4,446,666
2037	68	116,447	4,563,113
2038	69	115,010	4,678,123
2039	70	113,590	4,791,713
2040	71	112,187	4,903,900
2041	72	110,802	5,014,702
2042	73	109,434	5,124,136
2043	74	108,084	5,232,220
2043	75	106,748	5,338,968
2045	75 76	105,430	5,444,398
2045	77	104,130	5,548,528
2040	78	102,844	5,651,372
2047	78 79	101,574	5,752,946
2048	80	100,320	
			5,853,266
2050	81	99,081	5,952,347

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PRESENT VALUE OF NET LVL OF CHRISTINE 2001 - 2051

YEAR	AGE	LVL	CUMULATE
***	***	******	******
2051	82	79,545	\$6,031,892
SYNDER		\$6,031,892	